ECO-COOL™

BULLETIN FOR REFRIGERATION TECHNICIANS

ISSUE NO. 19 MARCH 2007

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Editorial

Dear Reader,

By the time you hold this issue of Eco Cool NCCoPP would have completed 3 years of implementation. We are proud of the activities undertaken and the results achieved so far. In the past 12 months alone, we have conducted 69 training programmes for Refrigeration Service Enterprise technicians across India, thereby imparting skills and environmental awareness to 1800 professionals. More than 180 technicians have been trained in good servicing practices and retrofit of mobile airconditioners, and 50 technicians in servicing and retrofit of open type compressor systems. A 5-day trainer refresher course aimed at enhancing trainer skills was also held. This year for the first time, special training programmes on retrofit of domestic appliances have been organised. The external monitoring, performed on selected training programmes, has confirmed the high quality of NCCoPP training programmes. Shortcomings identified during the monitoring, will be taken up as a challenge for improvement in the next training season. With this, both the NCCoPP and the preceding HIDECOR projects have provided training to over 16,500 Refrigeration and Air Conditioning (RAC) service technicians in the past 6 years!

Today NCCoPP having constantly learned from its experiences has progressively added new activities and has plans for a range of activities. The major challenge for NCCoPP today is to attain greater coverage, especially in remote areas of the country.

Another important challenge for NCCoPP is addressing the need for retrofitting of existing refrigeration units charged with ozone depleting CFCs and even HFC134a, an alternative with no Ozone Depleting Potential (ODP) but having a Global Warming Potential (GWP). The recently published 4th assessment report of the Intergovernmental Panel on Climate Change (IPCC) confirms that climate change is real, that warming has already started to impact the atmosphere and the biosphere and that HFC and HCFC emissions are increasingly contributing to Global Warming. In the year 2005, halocarbons globally contributed in the order of 20% of the total net anthropogenic radiative forcing of all greenhouse gases. This will raise pressure to limit the use of HCFCs and HFCs in future for which the RAC trade has to prepare itself. One way of addressing this challenge is by using hydrocarbon (HC) refrigerants for retrofitting, where suitable. From the market and from industry data we have evidence that retrofit activities relying on ozone and climate friendly HC refrigerant is rapidly gaining momentum, partly on ground of increasing prices for CFCs. The initiatives taken by the NCCoPP, HIDECOR and ECOFRIG projects, and particularly by NCCoPP's partners Godrej & Boyce Manufacturing Co. Ltd. and Hindustan Refrigeration Systems in marketing HC refrigerants in India, have contributed greatly in the reduction of greenhouse gas emissions. An analysis shows that for the operational year 2006-2007 alone, the use of HC refrigerant led to an offset of almost 40,000 tons of CO2 equivalent. The trend is sharply increasing as is illustrated in Figure 1. This significant impact goes beyond the immediate objective of the protection of the ozone layer. All of us, including you as a service technician have contributed directly to this. We also hope that other Indian refrigeration industries follow the HC path.

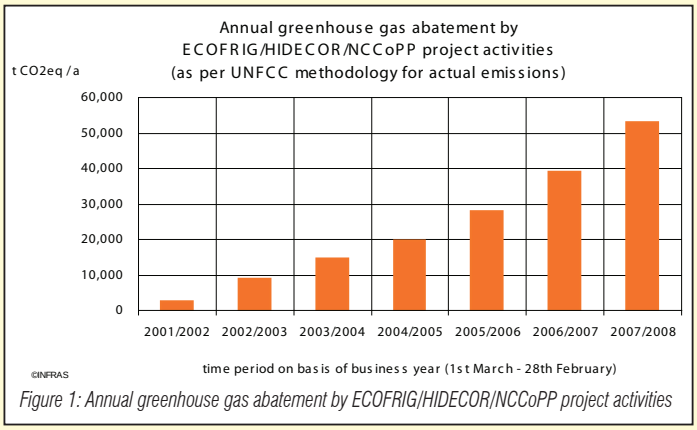

Figure 1: Annual greenhouse gas abatement by ECOFRIG/HIDECOR/NCCoPP project activities

To conclude, although NCCoPP already has had a significant impact in India, there is still a lot to do. NCCoPP strongly banks on your personal commitment, continued enthusiasm and support for successfully phasing out of CFCs and adopting environmental friendly servicing practices. It is after all you, the refrigeration servicing technician, and the joint efforts of the RAC community who can make a change for a better future.

Contributed by INFRAS

NCCoPP contributes to CFC Phase-out

NCCoPP contributes to the phase-out of CFCs in the RAC servicing sector by 2010 through:

- Targeting CFC-consuming RAC servicing sector firms
- Encouraging good servicing practices for CFC-based appliances
- Training the servicing sector technicians in handling new non-CFC technologies

NCCoPP 2-day practical training programmes scheduled from 2004 to 2009 propose to cover:

- CFC and ODS phase-out processes
- Servicing new HFC-134a and HC-based refrigerators and other commercial appliances, including retrofitting
- "Recovery & Reclamation" (R&R) of CFC refrigerants
- Updates on technology and market changes, appropriate tools/equipment
- Best Practices in servicing of Mobile Air-Conditioners (MAC)
- Retrofitting, review of retrofit options and good servicing practices for large commercial appliances using Open-Type Compressors (OTCs).

All domestic and commercial Refrigeration Servicing Enterprises can apply for training. Specialised 1 day training workshops will be held for MAC service enterprises. All training contacts can be found on page 7.

Advantages of Two-stage Vacuum Pumps*

The advantage of using **two-stage oil-sealed rotary vane vacuum pumps** in lieu of **single-stage pumps**

Rotary sliding-vane type vacuum pumps are commonly used for evacuating refrigeration systems. The aim of evacuation is to pull a deep vacuum of around 200 to 500 microns of Hg, particularly for refrigeration systems where the evaporation temperatures could range from -10ºC to -40ºC, to ensure that the system remains free of residual moisture and other non-condensable gases. This ensures safe and reliable working of the refrigeration system. These pumps come in single-stage and two-stage versions. As the latter costs much more, refrigeration technicians are tempted to buy the single-stage version. But this version is not able to pull as deep a vacuum as the double-stage one and the evacuation job is neither thorough nor well done. This article brings into focus the differences between the single and double stage versions, in terms of constructional features and working, performance and the reasons for the difference in performance. It is hoped that this article will help technicians to understand the reasons for going in for a two-stage pump. This assumes great importance when handling CFC free refrigerants which have zero tolerance for moisture and non-condensable gases.

The purpose of evacuation is to pull a deep vacuum to remove as much of the moisture and other gases as possible that reside in the sealed space of a refrigeration system, so as to make it available purely for the refrigerant that will be charged later in the system. Residual moisture and air act as contaminants that lead to choking of capillaries and accelerated destruction of the internals of the compressor. Sometimes, technicians use the system compressor itself as a vacuum pump, which is an entirely wrong procedure, since the system compressor does not help in pulling a deep vacuum and this is also not good for its life. Some others use the vacuum pumps of the rotary oil-sealed type, but for reasons of economy use the single-stage pump in lieu of the double-stage pump.

Construction and Working of Oil-sealed Rotary Vacuum Pumps

(a) The Single-stage pump

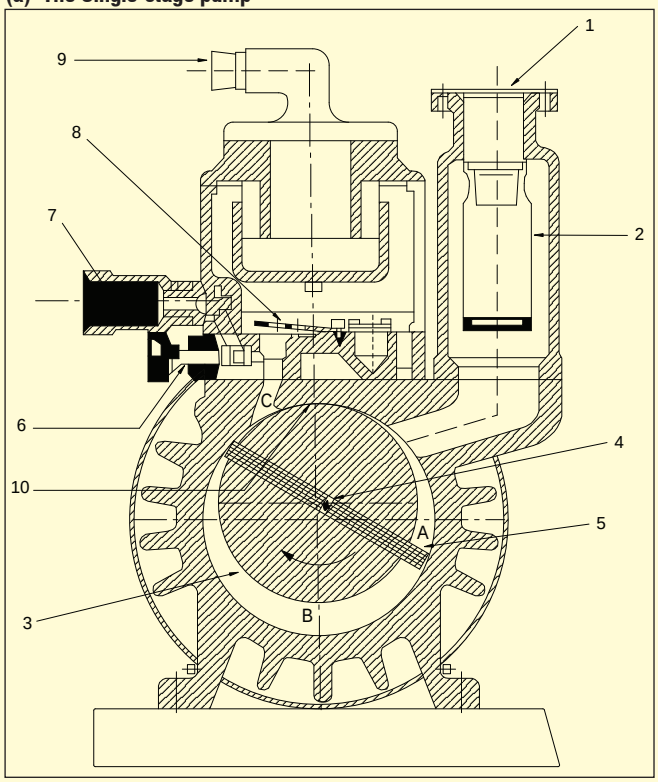

Figure 1

(1) Intake (2) Filter (3) Rotor (4)Spring (5) Vane (6) Gas Ballast valve (7) Filter (8) Discharge Valve (9) Exhaust (10) Sealing Surface

Figure 1 is a sectional view of a typical rotary oil-sealed sliding-vane type vacuum pump with a single-stage. All internal parts are immersed in oil. The meaning of 'single-stage' is that there is only a single rotor (3) mounted on the shaft. The rotor has two vanes (5), fitted in slots in the rotor body, that slide out as the rotor rotates. These vanes slide along the stator walls (10) thereby pushing forward the air drawn-in at the inlet (1) to eject it finally through the oil above the outlet discharge valve (8). It can, therefore, be seen that as the air is continuously drawn from the refrigeration system through the intake (1) and pumped out through (8) to the atmosphere, the pressure in the system falls rapidly to a low vacuum over a period of time. As mentioned earlier, in refrigeration systems, a deep vacuum of 200 to 500 microns of Hg is needed to ensure good evacuation of moisture and other gases. We need to determine whether this is possible with a single-stage arrangement. The creation of a deep vacuum is possible only if the sealing between the vanes and the walls of the stator is good. This sealing is done by oil which serves as a lubricant, coolant and sealant. The oil should be free of gas and air bubbles as these can partly escape into the vacuum side of the pump and enhance the low pressure created at the inlet of the vacuum pump. It is seen that as the oil, which covers the discharge valve, is exposed to the atmosphere, some of the outside air will be adsorbed as gas in the oil and find its way into the vacuum side of the pump, thereby limiting the obtainable ultimate pressure. This is the disadvantage of using single-stage pumps. Therefore, these pumps may not be capable of meeting the requirements of evacuation for refrigeration applications.

(b) The Two-stage pump

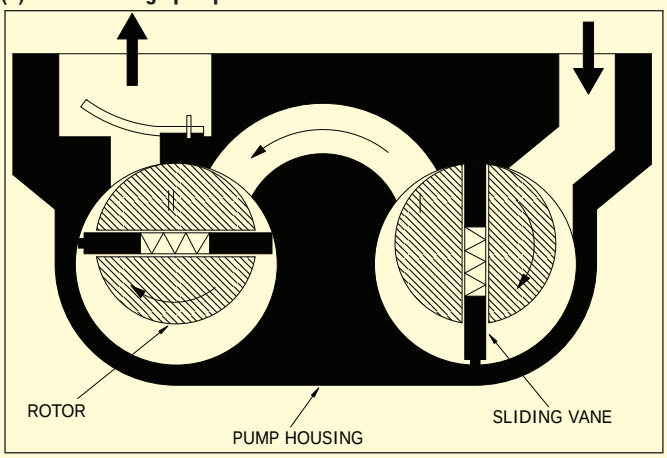

Figure 2

Single-stage pumps comprise of one rotor and stator block (Figure 1). The addition of a second stage, as shown schematically in Figure 2, by connecting the exhaust of the first stage to the intake of the second, ensures lower pressures in the system. This is due to the fluid (oil) circulating in the first stage containing less gas than the fluid in the reservoir (as the first stage receives pre-degassed oil). This ensures that the high vacuum produced in the first stage is maintained. This meets the requirements of vacuum for refrigeration systems. In actual practice, the two rotors are mounted on a common shaft in a common housing which has passages for allowing the flow of exhaust of the first stage to the inlet of the second stage.

Comparison of Performances of Single and Double-stage pumps

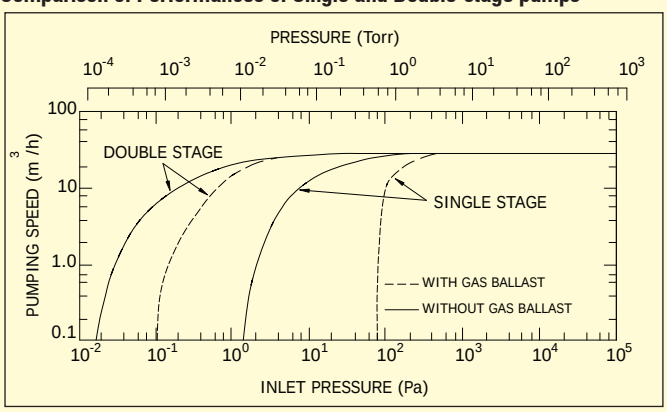

Figure 3

Fig 3 shows the performance of single-stage pumps against the double-stage pumps where the pumping speed (cum/hr) is plotted against the inlet pressure

(Pascals; where 1 Pascal = 7.5 microns of Hg). The two-stage pump has a wider operating range with higher flow (pumping speed) at any pressure and a lower ultimate pressure as compared to single-stage pumps.

In fact, a well known international manufacturer of vacuum pumps recommends single-stage pumps only for applications involving vacuum of 100 mbar (75,000 microns) and above. This implies that they cannot be used for AC and refrigeration systems as the vacuum created would be inadequate to remove all the moisture and non-condensable gases resident in a refrigeration system.

Given below are the tables presented by a Chinese manufacturer of vacuum pumps sold in India for single and double-stage pumps:

Model	Single-Stage	Double-Stage
Voltage	220v-50Hz	220V-50Hz
Free Air Displacement	1.3cfm	2.5cfm
Ultimate Vacuum	150 microns	50 microns
Power	¼ HP	1/3HP
Oil Capacity	220 ml	250 ml
Intake Ports	¼" flare	¼" flare
Stage	Single	Double
Net weight	7 kg	12.5kg
Dimensions	290x110x240 mm	336x123x 255mm

From the above table, it can be seen that the output in cfm (1 cfm=1.7 cum/hr=28.3 lpm) from the double-stage pump is higher and the ultimate or Blank-off Pressure is 50 microns against 150 microns of the single-stage pump. The blank off pressure is the pressure at zero flow with the pump running. With a blank off pressure of 150 microns the single-stage pump would hardly be delivering any air flow at 500 to 1000 microns where as with a blank off pressure of 50 microns the double-stage pump would be still delivering and evacuating the system at 500/1000 microns. Infact the flow of a single-stage pump (particularly the small portable ones) declines rapidly after 50,000 microns as compared to a double-stage pump whose decline is slower as shown in figure 3. Clearly the two-stage pump does a proper job of evacuation for refrigeration systems, though the price is almost double (about Rs.6000 against Rs.3500 of a single-stage) and the weight is also much more. But it is of no use to spend money (even Rs.3500) in buying a wrong piece of equipment which will never do a thorough job of evacuation and would result in customer call backs. It would also add more cost to repair and rectifying. It is like being penny (paisa) wise and pound (Rupee) foolish.

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Email: *iyerus@vsnl.com*

** Two-stage pumps are also referred to as double-stage pumps.*

Acknowledgements
The diagrams given in this article have been taken from the following publications:
(1) Vacuum Technology. Its foundations. Published by Leybold –Heraeus GMBH.
(2) A User's Guide to Vacuum Technology, 3rd edition, by John F. O'Hanlon, Published by Wiley-Interscience, John Wiley & Sons.

FAQs

This section will focus on a variety of FAQs and will look at it topic-wise. In this issue we focus on technical issues under RAC specific to 'Recovery and Recycling' and "Servicing Practices".

Recovery and Recycling

Q1. How to keep recovered refrigerant?

CFCs and HFCs are recovered in a recovery cylinder using a recovery machine. It is also recommended that the cylinder be labeled with the following information:

- Name of the refrigerant stored inside
- Weight

Q2. What to do with the recovered refrigerant?

Recovered refrigerant when not contaminated or only marginally contaminated can be used in the system again after repair (with a compressor burn out, refrigerants are heavily contaminated). Of course, it is best to recycle all refrigerant before reuse. But this is an economic question as multi-pass recycling machines are not cheap and only economical if sufficient refrigerant can be recycled over time. For this a group of technicians from the same locality could join together and purchase one machine and start recycling. Refrigerant recycling and reuse can only be done if refrigerants are not mixed! Hence, keep separate cylinders for each and every recovered refrigerant. NCCoPP has started 2 reclamation centers and technicians can make use of these (refer to page 6 for details).

Servicing Practices

Q1. The ideal clearances between tubes, for brazing, for good capillary action has been mentioned as 0.05mm to 0.200mm. What should be the depth of insertion?

The depth of insertion gets automatically determined when a correct swaging tool is used to swage the end of a tube which is to be brazed to another of the same size. It is usually kept equivalent to the OD of the tube. It is possible to also braze a smaller tube of 1/4" to a bigger tube of 3/8" tube without any swaging. However the clearance between the tubes becomes much higher than the permissible 0.200 mm and here the insertion has to be longer (about 0.75 to 1 inch) and a brazing rod with 15% Ag and 5% P has to be used even for Cu to Cu brazing. However when brazing a 3/16" Cu tube to a 1/4" Cu tube it will be necessary to swage the end of the 1/4" tube, as otherwise, the clearance between the tubes becomes too small (0.025mm).

Q2. How do you know what refrigerant is inside a system if the label on the refrigerator is missing?

In this situation the following is recommended,

a. Check for indicators such as the year of manufacture; any label (engraved or stamped) on the compressor; the type of filter drier and the manufacturer's manual. If the system is using a thermostatic expansion valve then the type of refrigerant is indicated on its body. Frost-free refrigerators having fans and defrost heaters are usually non-HC.
b. Observe if the thermostat, light switch, cabinet light, relay and overload protector are located and sealed safely from any form of sparks. This indicates that the unit is charged with HC.
c. Recover the refrigerant and have it tested using a refrigerant identifier.

In case of no gas is present within the system, check for the label on the compressor, any engravings on the housing, age and name of the refrigerator. If the name suggests being environmentally friendly, then the system will contain an R134a or HC gas. There could also be an indication of the manufacturer and type of the fridge. Another way could also be to call the service line of the manufacturer. Mostly, all refrigerators before 1996 contain R12 gas. Check as well with the owner for any manuals. The filter drier used in the system could also act as an indicator – type XH7 & XH9 is used for R134a systems; type XH5 is used for R12 & HC systems; and XH6 or XH9 is used for R22 systems.

Charging - this should only be carried out by reading the back pressure (suction side). The back pressure of R600a is much lower compared to other gases. At -10 deg C, R12/ R134a/ HC mix is approximately 1.2 bar g and R600a is below 0 bar g (in vacuum). Thus performance must be optimized by charging.

Refrigerant Identifiers

Introduction

The main function of the refrigerant identifier is to assist the servicing technicians to check the purity of commonly used refrigerants in the R/AC equipment such as R12, R22, R134a, hydrocarbons, and blends of these components. Recently, the refrigerant identifier is also being widely used by customs officers at their checkpoints to examine any suspicious ODS shipment that might have been falsely or intentionally declared as non-ODS chemicals. This fact-sheet is prepared to help the National Ozone Units (NOUs), customs officers and technicians to have a better understanding on the capabilities and correct use of the refrigerant identifier and its possible limitations, if not used properly.

Capabilities and Limitations of Refrigerant Identifiers

The refrigerant identifier utilizes a non-disperse infrared (NDIR) technology to determine the weight concentrations by weight of the selected refrigerant types. The instrument is normally designed for use only on commonly used refrigerants: R12, R134a, R22 and hydrocarbons.

With the introduction of new refrigerant blends that contain refrigerants other than R12, R134a, R22 and hydrocarbons, the instrument might incorrectly identify the composition of the refrigerant blend due to cross sensitivity issues of the sensing device. The chart below compares the actual composition with the test reading from one refrigerant identifier for some of the approved blends under US Environment Protection Agency's (EPA) Significant New Alternative Policy (SNAP).

The chart shows that if a blend refrigerant containing one or more components other than R12, R134a, and R22 is checked by the identifier, it will not correctly identify the blend. In fact, different identifiers will typically display different results. However, if the same identifier is used again on the same blend, it will display the same (incorrect) result. Therefore, if you have a pure sample of the blend, you can:

- test it with your identifier,
- record the composition indicated.
- use this information for future reference when checking other samples with the same identifier.

Refrigerant identifiers that are currently in use provided through various international agencies should not be used to identify the composition of refrigerant blends (such as 400 or 500 series refrigerants), as the results reported maybe misleading and may result in incorrect determination of the refrigerant type. Even newer refrigerant identifiers that can identify US EPA SNAP approved blend refrigerants should not be used for blends containing components other than R12, R134a, R22 and hydrocarbons without confirmation by a qualified laboratory using gas chromatography analysis. While some countries such as USA have learned to use the refrigerant identifiers to check other refrigerants, the process requires extensive experience and training. In cases involving refrigerant blends, the customs officers should carefully check the shipping and other supporting documents for any inconsistency. To determine the actual composition of the refrigerant blend, and if the customs decides it is necessary, the sample should be verified by an accredited laboratory using gas chromatography equipment – do not depend on the identifier on the site.

Test Results from One Diagnostic Refrigerant Identifier of different US EPA-SNAP approved blend refrigerants

Refrigerant Type		%R12	% R22	%R134a	%HC	%R124	%R142b
FRIGC	Factory Spec			59	2	39	
	Test Reading	26	2	69	3		
Freezone(contains 2% lubricant)	Factory Spec			79			19
	Test Reading	16		84			
GHGX4 Autofrost Chill-it	Factory Spec		51		4	28.5	16.5
	Test Reading	29	57	10	4		
Hot Shot	Factory Spec		50		1.5	39	9.5
	Test Reading	34	56	7	3.0		
Freeze-12	Factory Spec			80			20
	Test Reading	13		87			

Source: Mobile Air Conditioning Society (MACS) Worldwide Report: The Facts and the Myths about Refrigerant Contamination, Ward Atkinson, MACS Technical Advisor, www.macsw.org. Please also note the chart above shown only applies to older model units. Newer models with "Blend ID" software will indicate these SNAP refrigerants by name and the percentages shown on the display will be significantly different from the chart.

Tips for Using a Refrigerant Identifier

- Carefully read the identifier operation manual before using. The limitation of the use of refrigerant identifier is always clearly indicated in the manual.
- The instrument is designed for testing refrigerant vapor and will malfunction if exposed to liquid or samples heavily laden with oil. The sample hose must be connected to the low side or vapor port of the system or cylinder. DO NOT connect the sample hose to the high side or liquid port of the system or cylinder.
- The filter of the refrigerant identifier must be periodically replaced to ensure proper functioning of the unit. The filter should be replaced after 150 inspections as per Thailand's experience. However, replacement frequency would depend on the refrigerant's contaminants such as moisture, acid, and compressor oil. If discoloration in the filter occurs (reddish colour), it is also recommended to replace it.
- The identifiers currently in use around the world should only be used to check R12, R134a, R22, hydrocarbons, and combinations of these materials. If the identifier displays a result indicating a contaminated refrigerant, then it might be a refrigerant blend.
- If one shipment is declared as one kind of refrigerant blend, then do not try to use the refrigerant identifier to confirm the contents of the blend. But the refrigerant identifier can still be used to ensure that the shipment is not pure R12 or R22. If the identifier indicates that the contents of the shipment are a realistic mixture of R12/R134a/R22/HC, the customs should release the shipment under the name as it is declared. If the identifier indicates the refrigerant is pure or nearly pure R12 or R22, the shipment should be stopped.
- It has been established through some recent seizure cases in the region that some of the blend manufacturers/importers are intentionally labelling the drop-in blends as R134a to mislead the technicians and the end users. In case a shipment is declared as R134a, but the identifier displays the result as a mixture of R12/R134a/R22/HC, then the customs might need to double check with the other shipment documents and levy a penalty under the general customs code. The shipment could be released after correcting its label.

Contibuted by UNEP

Acknowledgement: UNEP would like to acknowledge the appreciation to Mobile Air Conditioning Society (MACS), Neurotics Inc. USA, and US EPA for the input and comments on the draft jointly developed by UNEP and Department of Industry Works, Thailand.

Customs Component
Update on training conducted

Under NCCoPP, UNEP is providing assistance to the Government of India along with UNDP, UNIDO, Government of Germany and Government of Switzerland. As part of its mandate, UNEP supports training of officers responsible and/or involved in the enforcement of production and consumption regulations of Ozone Depleting Substances (ODSs) in India. For the implementation of training activities under this project, UNEP works closely with National Academy of Customs Excise and Narcotics (NACEN), Faridabad, India. NACEN is an apex organization for imparting training to officers in the Customs, Excise and Narcotics wing of the Revenue Department under the Ministry of Finance. It has conducted training programs for Customs officers on 'Cross-Border Trade of ODSs' and 'Controls for Preventing Illegal Trade'. NACEN in cooperation with UNEP has also conducted customs training for Bhutan customs officers in Thimphu in November 2005, and for Afghanistan customs officers in Kabul, between 28th and 30th November 2005. Since 2001, more than 100 customs officers have been trained by NACEN on ODS trade regulations and use of identifiers for identification of CFCs in consignments that contain them which can be illegally smuggled into India. In addition to training activities, CFC identification equipments have also been distributed to more than 20 Customs entry points for testing consignments on a need basis.

In addition to this, the project has also provided training to other National stakeholders like Pollution Control authorities, State Department of Environment, Police, Surveyors etc, who are responsible for checking and reporting on imported chemicals, so as to facilitate effective implementation of ODS rules. These trainings have been cost-effectively implemented in different regions of the country. Currently, NACEN is also implementing a project on 'On-line Training System for ODS Trade Monitoring and Control' with inputs from the Government of India and the UNEP ROAP office.

For more details please contact:

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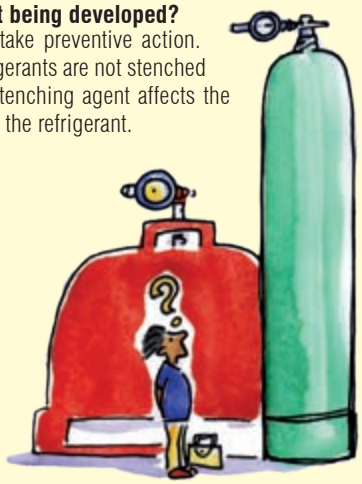
Email: adgnacen@gmail.com

Technicians Corner
What you say to us Q and A

If LPG cylinders weighing 15 kg can be used at home, why are bigger capacity HC-based appliances not being developed?

The use of HC refrigerants which are flammable are regulated by the fact that the concentration of HC gas should not exceed the LFL (Lower Flammability Limit) which is about 1.8 to 2% v/v concentration in air. This is the equivalent of about 35 grams of HC per cu.m of air. The practical limit is reduced to about 1/5th of the LFL which works out to about 8 grams per cu.m of air. Thus, in a room of 3x3x2.5m (22.5 cu.m volume), the maximum charge cannot exceed 180 grams. These norms are in line with British Standards 4434:1995 in the absence of Indian Standards for Safety when using HC refrigerants. BS4434 permits the use of sealed systems with a refrigerant charge of up to 1.5 kg in residences, provided the sudden loss of refrigerant will not raise the concentration of the refrigerant to above the practical limit of 8 grams/cu.m and provided there are no sources of ignition associated with the refrigeration system or located in an area where the refrigerant could gather in the event of a leak.

The safety limits for LPG gas when used in homes for cooking should logically be the same as for HC refrigerants as most of their ingredients are similar, although may be not the proportions. Any leaks from LPG cooking cylinders exceeding the limits for HC refrigerants, as defined above, are equally hazardous. Thus, LPG is stenched to provide odour signals of leakage that enable the user to take preventive action. HC refrigerants are not stenched as the stenching agent affects the purity of the refrigerant.



** This question has been asked by a technician during an NCCoPP training programme.*

Newsflashes from Ozone Layer

Volcanic Aerosol Clouds and Gases Lead to Ozone Destruction

Volcanic eruptions destroy ozone and create 'mini-ozone holes', according to two new studies by researchers at the Universities of Cambridge and Oxford.

The new research discovered that volcanic gases released during eruptions accelerate reactions that lead to ozone destruction. The researchers found that even relatively small volcanic eruptions can destroy ozone and create localised 'holes' in the stratosphere.

Previously, scientists had concentrated on the climatic effects of the tiny particles of volcanic sulphate created from the sulphur dioxide gas emitted during an eruption. For the first time, analysing data from an eruption of the Hekla volcano, Iceland in 2000, the researchers discovered that volcanic gases may also lead to the formation of ice and nitric acid particles. This is a critical finding as these particles 'switch on' volcanic chorine gases, accelerating reactions that lead to ozone destruction.

Dr Millard, from the University of Cambridge, said, "We have shown for the first time that volcanic eruptions which penetrate the stratosphere can lead to the formation of the type of clouds that promote reactions with volcanic chlorine gases - gases that destroy stratospheric ozone and lead to the formation of 'mini-ozone holes'."

The ozone losses due to the small eruption at Hekla lasted for about two weeks, and eventually returned to normal levels. This is the first time that people have observed the complete removal of local ozone following a volcanic eruption.

"Now we want to find out what might happen to the ozone layer after a much larger eruption," said Dr David Pyle, University of Oxford, project coordinator. "For example, is there significant loss of ozone and increased ultra-violet radiation at low latitudes following large explosive eruptions? We want to understand this, so that we can have a better picture both of what might have happened in the past and of what may happen in the future".

For more information:

http://www.sciencedaily.com/releases/2006/11/061108100414.htm

Newsflashes from NCCoPP

Equipment Support Scheme (ESS) Update

A brief on the current status of the ESS distribution (how many units have been delivered and geograpical coverage till date) for both regular units & mini-reclamation centres.

Equipment Support Scheme (ESS) Phase 1		
Region	**State**	**Total Distributed**
South	Andhra Pradesh	51
South	Karnataka	38
South	Tamil Nadu & Pondicherry	49
North	Chandigarh	5
	Total	143

Equipment Support Scheme (ESS) Phase 2 (Ongoing)		
Region	**State**	**Total Distributed**
West	Gujarat	43
West	Maharashtra	16
South	Kerala	22
	Total	81

Equipment Support Scheme (ESS) Phase 3		
Region	**State**	**Total Distributed**
North	Chandigarh (Punjab, J&K, Uttaranchal, Haryana, Himachal Pradesh)	Ongoing
North	Rajasthan	Ongoing
North	Uttar Pradesh	Ongoing
North	Delhi	Ongoing

Equipment Support for Mini Reclamation Centres

Considering Government of India regulatory obligations and the expected demand, the project has launched a scheme to start a business activity for reclaiming of CFC refrigerants in India. Two business centers, one each in Bangalore and Chandigarh, have started operations. Many more are proposed to take off till the completion of the project. The scheme aims at providing support to entrepreneurs interested to set up a business model for reclaiming refrigerants. The scheme aims at supporting these entrepreneurs by providing financial support to purchase the reclamation equipment procured under the project. The total cost of the equipment is 6,000 USD but the entrepreneur pays only 1,200 USD (equivalent to INR 52,800).

GTZ Proklima has invited qualified entrepreneurs from India to express their interest in providing the above-mentioned services.

For further details refer to www.nccopp.info or contact: ***GTZ India,*** *Smita Vichare,* ***Tel:*** 011- 26611 021
Email: smita.vichare@proklima.org

Reclamation of Recovered Refrigerant

Are you recovering CFCs and do not know what to do with them?

You can avail of our reclamation services!

Services on Offer

- Reclamation of refrigerant for a minimal "processing charge"
- Recovered refrigerant can be deposited at Reclamation Centres

Two reclamation centres have been set up in India (Bangalore and Chandigarh) where you can take refrigerant for reclamation. Reclamation of refrigerant has started here and the recovered CFC 12 has been reused in open type compressors of ice candy machines. The centre at Chandigarh was formarlly inaugurated on the 28th February 2007 by Mr. Surinder Kumar, Additional Director(s), MoEF, and Mr. Jagjit Singh, Joint Director, Technical Education, from Chandigarh.

Contact:

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  808 10th A main, 1st stage,
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Technicians Trained

Training Program	RSE	OTC	OTC Pilot	ITI Instructor	MAC	MAC Pilot	NCCoPP TOT	TOT	Independent	Mini-MAC TOT	ITP/ SGTB	Railway Technician
Total	4949	166	26	66	428	29	9	26	26	29	67	15

Grand Total 5836

BOOK POST

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NOTE: The Kirloskar group has exited from joint venture of Kirloskar Copeland Limited w.e.f. 26th July 2006. The new name of **"Kirloskar Copeland Limited"** is **"Emerson Climate Technologies (India) Limited"**. All references to **"Kirloskar Copeland Limited"** will henceforth be made in the name of **"Emerson Climate Technologies (India) Limited"**

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